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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,529	07/30/2001	Kazuhiko Hayashi	01FN046US	9042

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EXAMINER	
KLIMOWICZ, WILLIAM JOSEPH	
ART UNIT	**PAPER NUMBER**
2652	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/916,529	HAYASHI ET AL.	
	Examiner	Art Unit	
	William J. Klimowicz	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 5-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 5-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12-1-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

Claims 1, 2 and 5-8 are currently pending.

Claims 3, 4 and 9-63 have been voluntarily cancelled by the Applicants.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 6, the recitation of "a magnetic layer provided on the lower conductive layer" (line 3 of claim 6) and "a free layer provided on the magnetic layer" (line 4 of claim 6) is inconsistent and unsupported by the Applicants' elected embodiment (i.e., Species 1c corresponding to FIG. 12 - see Paper No. 10, filed by Applicants on May 7, 2003) as elected by the Applicants in response to the restriction requirement previously set forth by the Examiner.

More concretely, the recitation of such structure as "a magnetic layer provided on the lower conductive layer" in conjunction with "a free layer provided on the magnetic layer and having an orientation of magnetization *varied by a magnetic field coupled magnetically to the magnetic layer and applied thereto*" (lines 4-6 of claim 6; emphasis added) is drawn apparently to the non-elected embodiment corresponding to Figures 29-31 of Applicants' application.

In the non-elected embodiment corresponding to Figures 29-31 (non-elected Specie IVa as per ten Restriction Requirement originally mailed on April 11, 2003 - which corresponds to the Applicants' specification at page 41, line 5 through page 46, line 1, inclusive), a magnetic layer (8b) is indeed a magnetic layer provided on the lower conductive layer" in conjunction with "a free layer provided on the magnetic layer and having an orientation of magnetization *varied by a magnetic field coupled magnetically to the magnetic layer and applied thereto.*" See Applicants specification and Figures 29-31, wherein it is expressly stated that "the magnetic layer **8b** is to transmit a vertical bias magnetic field applied by the vertical bias layer **2b** to the free layer **3b** by means of magnetic coupling such as ferromagnetic coupling, antiferromagnetic coupling , or magneto-static coupling." See Applicants' specification at page 43, lines 7-11.

Thus, the metes and bounds of the claims cannot be readily ascertained within the scope of the elected embodiment of FIG. 12, since here is no correlation between the elected embodiment and the pending claims 6-8 as presently drafted. The rejection of claims 6-8 under 35 U.S.C. 112, second paragraph is sustained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Redon et al.

(US 6,469,879).

As per claim 1, Redon et al. (US 6,469,879) discloses a magneto-resistance effect element (1) comprising: a lower conductive layer (71); a free layer (20 and/or 23) provided on the lower conductive layer (71) and having an orientation of magnetization varied by a magnetic field applied thereto (e.g., see COL. 5, lines 37-39), said free layer thereby acting as a magnetic sensing layer changing the orientation of magnetization in accordance with the direction and magnitude of the magnetic field; a non-magnetic layer (30) provided on top of the free layer (20 and/or 23); a fixed layer (40) provided on the non-magnetic layer (30) and having a pinned orientation of magnetization (e.g., COL. 5, lines 38-43); and a vertical bias layer (61), provided on said lower conductive layer (71), for applying a magnetic field to said free layer (20 and/or 23), said free layer (20 and/or 23) being patterned to make an end portion thereof overlap that of said vertical bias layer (61) as is readily seen in FIGS. 1 or 2, wherein the free layer (20 and/or 23) and the vertical bias layer (61) overlap each other by at least the length designated by Lfe in FIGS. 1 and 2), and said free layer (20 and/or 23) is greater in length (Lf) in the direction of a magnetic field (i.e., the longitudinal direction as depicted by biasing fields (α1)) applied thereto by said vertical bias layer (61) than said fixed layer (40) (length Lp), and a sense current for detecting a change in electrical resistance of said non-magnetic layer (30) flows substantially in perpendicular relation to said non-magnetic layer (30) (e.g., see COL. 7, lines 33-35).

Additionally, an underlying layer (e.g. 21, 22) is provided for the free layer (e.g., 23) and is provided under said free layer. The layer comprising films (21 and 22) is construed as an "underlying layer" since it is a layer which underlies the free layer by being deposited directly underneath the free layer (23). The underlying layer (21, 22) for the free layer in contact with

said free layer (e.g., 23) and said vertical bias layer (61), and said lower conductive layer (71)(cf. FIGS. 2 and 3).

As per claim 2, said lower conductive layer (71) has a recessed portion on an upper surface thereof, and said vertical bias layer (61) is provided so as to allow at least part thereof to be buried in said recessed portion (e.g., see FIG. 2).

As per claim 5, further comprising a vertical bias layer protective layer (e.g., (93)) provided on said vertical bias layer (61), and said vertical bias layer protective layer (93) is in contact with said vertical bias layer (61) (e.g., see FIG. 2), and said vertical bias layer protective (93) is in contact with layer of at least one of said free layer (20 and/or 23) and said underlying layer (21, 22) for free layer (23).

Response to Arguments

Applicants' arguments with respect to the pending rejected claims have been considered but are deemed nonpersuasive.

The Applicants allege that the layer (23) of Redon fails to anticipate the invention as presently claimed since "it will be noted that Redon neither discloses nor suggest such a relationship [overlapping] between the free layer and the vertical bias layer." See Applicants remarks at page 6, last paragraph of the Amendment filed September 2, 2004. The Applicants then go on to recite "vertical bias layer 61 is not overlapped by the free layer ***as compared to Figure 12 of the present invention***." *Id.* at page 7. Emphasis added.

The Examiner respectfully, but nevertheless strenuously disagrees. As set forth in the rejection, *supra*, Redon et al. (US 6,469,879) discloses the free layer (20 and/or 23) as being

patterned to make an end portion thereof overlap that of said vertical bias layer (61) as is readily seen in FIGS. 1 or 2, wherein the free layer (20 and/or 23) and the vertical bias layer (61) overlap each other by at least the length designated by Lfe in FIGS. 1 and 2). The Examiner is charged with interpreting the scope of the claim language, in light of the Applicants' specification, as opposed to "comparing," for instance the prior art Figures with "Figure 12 of the present invention."

Moreover, as previously maintained by the Examiner in a previous Office action, but worth repeating again, the Applicants' previously had stated that layer (23) cannot be reasonably construed as a "free layer" since it is part of layers 22 and 21, which constitute the MR element (20) as a whole.

The Examiner respectfully disagreed with the Applicants' characterization. More concretely, the Examiner steadfastly maintained that the layer (23) is indeed a free magnetic layer, which expressly functions as a magnetic sensing layer changing the orientation of magnetization in accordance with the direction and magnitude of the magnetic field. The magnetization vector (23a) of the free layer (23) rotates in response to an external magnetic field. That is, although layer (21) *also* additionally functions as a free layer with a magnetization vector (21a) which is always anti-parallely coupled to magnetization vector (23a) via antiparallel coupling layer (22), layer (23), nevertheless, functions as and is a free layer. Absolutely nothing in the invention as presently claimed, precludes such a broad, yet reasonable interpretation. Moreover still, as acknowledge by the Applicants, US. Patent No. 5,408,377 and US Patent Application Publication US2003/0197505 *clearly and unquestionably support* the Examiner's use of the terminology of reasonably construing that one ferromagnetic layer of the APC MR

element is indeed a ***free layer***, which functions as a magnetic sensing layer changing the orientation of magnetization in accordance with the direction and magnitude of the magnetic field.

It is further noted that claim 1 includes the transitional phrase "comprising." Thus, the claims are open ended, by containing the word "comprising." Other layers, including an additionally antiparallely coupled free layer (21) are not in any way excluded from the *claimed invention*.

Furthermore, in patent law, "comprising" is open-ended word and one of enlargement, not of restriction; in contrast, "consisting" is word of restriction and exclusion.

As set forth in *Parmelee Pharmaceutical Company et al. V. Zink*, 163 USPQ 271(CA 8 1961):

> The word "comprising" in the patent law is an open-ended word and one of enlargement and not of restriction. "Claim 17 includes the expression 'loose granules of a natural material of the group comprising wood and grain.' The word 'comprising' does not exclude other materials besides wood and grains." *Ex parte Dotter*, 12 USPQ 382, 383-4. (d) In contrast, the word "consisting" is one of restriction and exclusion.

Similarly, as set forth in *Intermountain Research and Engineering Company, Inc., et al. V. Hercules Incorporated et al.*, 163 USPQ 390 (DC CCalif. 1969):

> Claims which define compositions as "consisting essentially" of named ingredients do not embrace compositions containing solid ingredients which are not expressly set forth in claims and which change character of composition; however, claims, which define compositions by use of "comprising," are open ended and encompass compositions which have ingredients named in claims and also other ingredients.

Moreover still, as set forth in the rejection, *supra*, Redon et al. (US 6,469,879) discloses an underlying layer (e.g. 21, 22) which is provided for the free layer (e.g., 23) and is provided

under said free layer (23). The layer comprising films (21 and 22) is construed as an "underlying layer" since it is a layer which underlies the free layer by being deposited directly underneath the free layer (23). The underlying layer (21, 22) for the free layer in contact with said free layer (e.g., 23) and said vertical bias layer (61) (cf. FIGS. 2 and 3).

The Applicants appear to believe that their "underlying layer" somehow is structurally and/or functionally different, or perhaps, formed of a different composition from the underlying layer of Redon et al. (US 6,469,879), as interpreted by the Examiner.

It s noted, however, that all the claims require is an underlying layer, which no other structural or functional or compositional attributes associated with it. Thus, the Examiner has interpreted the underlying layer in a broad, yet reasonable manner, that is completely consistent with the plain and ordinary meaning of the term "underlying."

Note, the Applicants do not point to an express definition within their specification that would preclude this broad, yet reasonable interpretation.

Pertaining to the claims rejected under 35 U.S.C. § 102 as being anticipated by the disclosure of Redon the following should be noted. Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir.); *cert. dismissed*, 468 U.S. 1228 (1984); *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 72.1 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

The Examiner, as clearly articulated in the rejection, *supra*, has set forth a one-to-one

correspondence with each and every element of the *claimed* invention. As recited MPEP§2106:

> Office personnel are to give claims their ***broadest reasonable interpretation*** in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). ***Limitations appearing in the specification but not recited in the claim are not read into the claim.*** *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow. . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. . . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). [Emphasis in bold italics added].

Moreover, one must also bear in mind that limitations contained within Applicants' arguments cannot be read into the claims for the purpose of avoiding prior art. *In re Sporck*, 386 F.2d 924, 155 USPQ 687 (CCPA 1968).

As set forth in the MPEP§ 706, "the standard to be applied in all cases is the "preponderance of the evidence" test. In other words, an examiner should reject a claim if, in view of the prior art and evidence of record, it is more likely than not that the claim is unpatentable." Clearly, the Examiner has established that one of ordinary skill in the art would *reasonably* construe the one-to-one correspondence with each and every element of the *claimed* invention, in the manner set forth in the rejection, *supra,* by at least the *preponderance* of the evidence. The Applicants' arguments have fallen well short of rebutting the Examiner's *prima facie* case of anticipation.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (703) 305-3452. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William J. Klimowicz
Primary Examiner
Art Unit 2652

WJK